

in bundles. At first the frond contains only one or two filaments (as correctly stated by Mr. Hassall in his 'British Fresh-water Algæ'); but these dividing as in *Oscillatoria*, the inflated frond becomes completely filled and at length ruptured, when the filaments escape from it to form new plants.

I intend in a future communication to offer some evidence in proof that the appositional branches in *Rivularia*, *Calothrix* and other genera are merely modifications of the mode of growth here described.

VII.—On the Structure of the Teeth of some Fossil Fish of the Carboniferous Period. By Prof. OWEN, F.R.S.

To the Editors of the *Annals of Natural History*.

GENTLEMEN,

IN the interesting and instructive summary of the modifications of the teeth in fossil fishes of the carboniferous period which Mr. M'Coy has given in the 'Proceedings of the Cambridge Philosophical Society,' June 1848, he notices a layer of true enamel in '*Centroodus*,' which he says "is quite distinct from that dense modification of *dentine*, which, forming the polished surface of most fish-teeth, has been confounded with true enamel, but which it is here proposed to call '*ganoine*' in future descriptions" (p. 65). I have long been in the habit of applying the term '*ganoine*' to the peculiar tissue which forms the enamel-like surface of '*ganoid scales*;' but, as the term has been published by me in no other way than orally in lectures, I should be willing to resign it for the new dental tissue which Mr. M'Coy professes to have discovered, if his claim to the discovery were sound. If I mistake not, Mr. M'Coy first announced his discovery in your 'August Number' of the present year, p. 124, where, after animadverting on the frequent mistake of his new modification of *dentine* for true enamel, he says: "The latter is, however, secreted by a distinct organ quite external to and independent of the *dentine*, while the false enamel, which I propose to call '*ganoine*,' is merely produced by the calcigerous tubes of the *dentine* becoming suddenly straighter, closer and more numerous as they approach the surface" (p. 124).

In my '*Odontography*' I defined what I believe to be the '*ganoine*' of Mr. M'Coy in the following words: "In some instances, as in the teeth of the flying-fish (*Exocoetus*) and sucking-fish (*Remora*), the substance of the tooth is uniform, and not covered by a layer of a denser texture. In others, as the shark, *sphyræna*, &c., the tooth is coated with a dense, shining, enamel-

like substance ; but this is not true enamel, nor the product of a distinct organ ; it differs from the body of the tooth only in the greater proportion of the earthy particles, their more minute diffusion through the gelatinous basis, and the more parallel arrangement of the calcigerous tubes ; but it is developed in and by the same matrix, and resulting from the calcification of its external layer, is the first part of the tooth which is formed" (p. 8). I then go on to cite the fishes that have true enamel, developed from a distinct organ (p. 9) : and the modifications of the enamel-like dentine are described at pp. 34, 54, 56 *et passim**. To most of the modifications of dentine in fish-teeth I have assigned and published names, *e. g.* 'osteodentine,' 'vasodentine,' 'plicidentine,' 'dendrodentine,' 'labyrinthodentine'† : if it be really requisite to give a name to the modification of hard dentine above defined, I would suggest to Mr. M'Coy the desirableness of adhering to the terminology already in use. The term 'ganoine' is required for the enamel-like tissue of ganoid scales, and that of 'vitrodentine' would have been the one I should have proposed for the tissue which I believe myself to have first defined, had I not been checked by the observation of the very gradual passage of hard or true dentine into it in many fishes, and by the natural desire to reduce the number of new terms to the minimum which the exigences of science seemed to require.

From the terms of the descriptions quoted from the 'Annals and Magazine of Natural History,' 1848, p. 124, and from the 'Proceedings of the Cambridge Philosophical Society' for June 1848, anatomists might be led to cite the subject of them as the 'ganoine of M'Coy ;' but I am sure that gentleman is above the device by which small zoologists, of what our plain-speaking German brethren call the 'Gattungsmacherei,' endeavour to appropriate a new species discovered and defined by another, by the mere imposition of a name.

I remain, Gentlemen, your very obedient servant,

RICHARD OWEN.

* The texture of the tooth of *Ctenodus* is described as presenting "a coarse osseous structure at the base, supporting a dense osseous or enamel-like layer," p. 63. Although in defining the obvious external characters of the tooth of *Petalodus* the term 'enamel' is used, I am careful, in describing the structure, to state that "the short terminal branches of the medullary canals, which distribute the calcigerous tubes to the enamel-like outer layer, are slightly bent downwards," &c., p. 62 : so that after the previous definition of the 'enamel-like' substance at p. 8, no mistake could be made.

† 'Odontology' and 'Lectures on Vertebrata,' tom. i. p. 226.